1750 METERS: WESTERN UPDATE #56

THE WESTERN NEWSLETTER FOR THE EXPERIMENTER'S BAND (160 TO 190 KHZ)

June 9, 1988

Available for business-size 25 cent SASE's, plus 60 cents per issue (or $7 per year)
from: Jim Ericson, 226 Charles St., Sunnyvale, CA 94086

ACTIVE WESTERN LowFER BEACON STATUS (LIST COMPILED June 4, 1988)

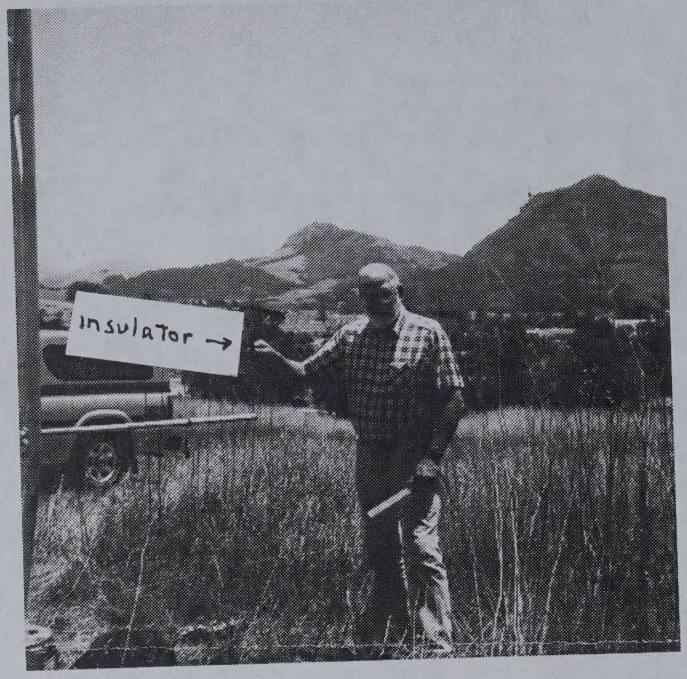
FREQ(kHz)	IDENT	QTH	SKED INFO
163.85	M	Ocean Beach, CA	24h/7d.
166.667	H	40 Mi. E of San Diego, CA	24h/7d
167.25	AHN	Fallbrook, CA	24h/7d
169.863	1SUN	Durant, OK	Off till September
175.225	MAX	Wheatland, WY	24h/7d CW. BPSK/ASCII by request.
175.388	KRY	Chardon, OH	24h/7d
175.703	FAW	Orem, UT	24h/7d
176.00	HDOMBAY	Morro Bay	24h/7d
176.26	C O	Glenwood Springs, CO	24h/7d
176.963	C	near Morro Bay, CA	24h/7d.
177.48	UCP	Saratoga, CA	Daily, approx. 1400 to 1700 GMT.
177.750	CT	Bountiful, UT	24h/7d (BPSK/CCW alternating)
178.00	AT	Crow, OR	24h/7d.
179.0	MPM	Salt Lake City, UT	24h/7d ASCII/CW alternating 5minutes.
180.601	NX	Los Altos Hills, CA	24h/7d
181.17	IZJ	San Gabriel, CA	Daily. Silent 0700 to 1100 GMT.
181.286	MEL	San Jose, CA	24h/7d.
181.711	TLX	Novato, CA	24h/7d
182.62	FPV	Granada Hills, CA	24h/7d
182.672	G	Palo Alto, CA	24h/7d. Note QSY.
182.88	H2	San Diego, CA	24 hours weekends
183.160	PRK	Saratoga, CA	24h/7d
183.63	PLI	Toluca Lake, CA	24h/7d
184.016	EK	Sunnyvale, CA	24h/7d
184.425	V	Sunnyvale, CA (Ericson)	testing
185.0	ZYK	Redway, CA	24h/7d
185.100	dasher	Rohnert Park, CA	24h/7d At Sonoma State Univ.
185.49	AZ	Tucson, AZ	Off till September
186.75	BA	Lancaster, IL	24h/7d
187.263	SKY	9 mi. NW of San Simeon, CA	By request. Contact Z2 or EK.
187.30	UPN	Cincinatti, OH	24h/7d
187.49	J	Los Angeles, CA	24h/7d.
187.50	DCH	Berlin, MD	Off till September
188.47	9HDQ	Daleville, IN	On but sked unknown.
190.4	OHH	Ontario, Canada	24h/7d.

(Check means sig logged at EK QTH in May/June. Double check is QSO with EK. Non-Western listings are beacons currently being copied in the West, or they have SASE's on file with us).

EK NOTES: Well, it's summertime again and understandably LowFER activity is a bit subdued. From my perspective, a lot of folks are building transmitters and antennas, but listening is definitely down. Signals here (out to 175 miles) are pretty good.

You will note that **Mike Mideke's Z2 NEWS** is absent in this issue. Z2 NEWS (or an equivalent column) will continue in the Western Update, but this month Mike has been swamped by other writing projects, in addition to plenty of early Summer chores around the ranch. Look forward to an interesting article detailing the history of his Z2 LW beacon in an upcoming **LOWDOWN** issue. And, Mike will bring us up-to-date on his activities in the next WU issue.

We've got 107 of you with SASE's on file for the Western Update. Please check whether you have SASE's on file, because this continues to be the basic requirement for receiving the WU. **No SASE's...No WU**. Thanks to those who sent a bit extra for the "WU printing kitty". Over the course of a year, the financial aspect seems to work out about even. This says a lot for the people involved in the hobby!



MAILBAG: Cliff Buttschardt of Morro Bay sent along these photos of his new "**C**" beacon located on top of a grassy hill between San Luis Obispo and Morro Bay. The antenna is a 50 foot vertical wire "outboarded" with insulators from a handy unused tower! In the upper left photo Cliff is holding on to the bottom insulator (which is visible in the upper left hand corner of the bottom photo). The upper right photo shows the transmitter in a bucket, along with a 12 volt gel cell. The beacon is doing very well, and is being heard by me in Sunnyvale...about 175 miles. Cliff is running 1.0 Watts DC input to a VN88 final amplifier. Antenna current is 90 mA.

Max Carter writes from Wyoming, "I've doubled the number of LowFER stations I've seen in my lifetime! On a recent visit to Salt Lake city, **Mark Mallory** gave me the grand tour of LowFER activity. Mark showed me the current **MPM** and the computer that has been sending me all those BPSK messages. MPM features an automatically tuned loading coil which keeps the antenna perfectly resonated at all times. It uses a stepper motor on a variometer. We dropped in on **Clint Turner** who showed us his station and demonstrated its BPSK/ASCII mode. We also visited **Chris Spencer (FAW)** who was in the process of re-erecting his antenna after a wind storm. He also demonstrated his computer generated voice ID'er. Does that ever sound strange! Anyway, wanted everyone to know that LowFERing is alive and well in SLC."

Frank Cathell (H) writes from the San Diego area that he has copied Cliff's C beacon, and also **AHN** in Fallbrook. He adds, "**PLI, FPY, M**, and occasionally **IZJ** are still in there during the day. **M** has improved by 3 to 5 dB so Tom must have done some work on the system."

Dear Jim :

About a year ago I wrote and told you I had a circuit for receiving signals in very noisy conditions. You mentioned it in WU but you referred to it as a filter.

In fact it is not a filter but a circuit that can distinguish between the desired signal and the noise background. I developed it in answer to a challenge created by watching the usual filter-and-amplitude-detector type of computer interface unit respond to more noise blurps than signals.

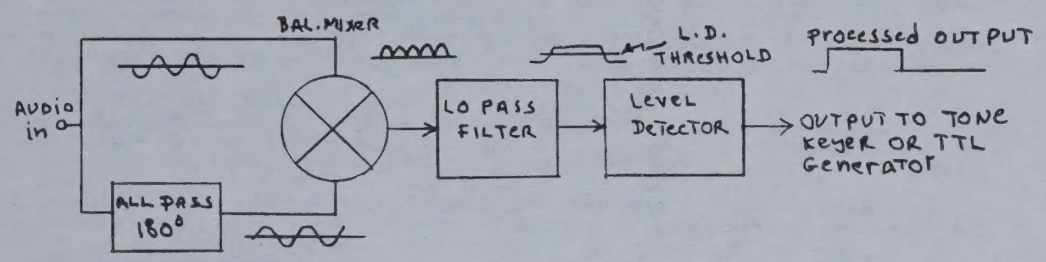
The whole secret lies in the use of a correlation detector. The incoming signal is split into two channels, one goes directly to one input of a double-balanced mixer, and the other goes to the other input after being delayed by 180°. You will see that the signal is its own "injection oscillator".

A coherent signal will provide the necessary inputs to the balanced mixer and in the correct phase. Although one input is delayed, it still looks like the real thing. On the other hand, the noise is entirely random and can only correlate weakly since it is entirely random in phase, and noise spikes will usually be present in only one of the mixer input ports at any instant of time.

You would enjoy watching the thing demodulate CW signals with the Woodpecker so loud the signals are hard to read by ear, or when my wife turns on the fluorescent lights in the garage. Many times the Woodpecker knocks the gain down so far that in order to get a usable signal it is necessary to use manual gain control. There is a signal strength meter, used for peaking the tuning, and the noise pulses just make it twitch up and down around zero. Then when a signal shows up the meter goes to about 35 to 45 on the scale of 50.

I have sketched the idea without any frills such as audio oscillator, keyer and speaker or TTL generator for the computer, on the other side of this sheet.

73
Jim Welch
Jim, KK6N

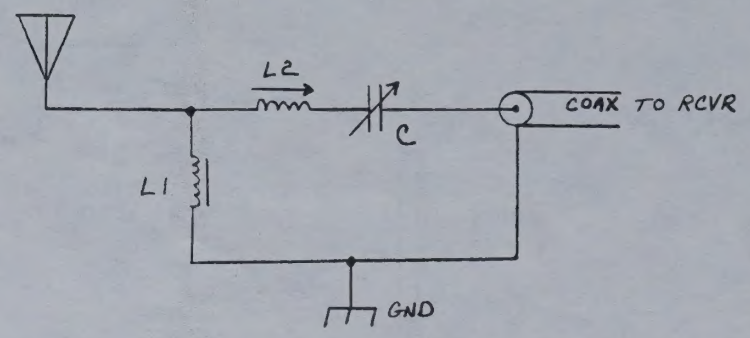


Jim adds, "Don't filter the input signal. It fools the detector. Noise looks like a coherent signal due to ringing."

A SIMPLE LOW BAND ANTENNA TUNER

by: Frank Cathell ("H")

For reasons not entirely understood by myself I have been unsuccessful in making a parallel tuned circuit work properly as an antenna tuner for the low frequency bands. The following schematic is a simple series resonant antenna tuner which performs very well on the low frequencies (100 Khz to 500 Khz) with random wire antennas from 50 to over 500 feet long. The performance enhancement is much more noticable on the shorter length antennas. L1 is a standard Miller (or equivalent) 2 to 2.5 millihenry RF choke. L2 can be made by unwinding turns from a slug tuned TV horizontal oscillator coil until the inductance is about 10 millihenries. The slug can then be adjusted (withdrawn) to optimize performance in the upper areas of the band when the capacitor plate meshing in C becomes minimal and the resultant coupling becomes poor. C is a conventional 365 picofarad variable capacitor. Note that the stator part must be insulated from the chassis ground. Needless to say, a good earth-ground connection is essential.



A LOWFER ANTENNA

by: Herb Vanderbeek ("G")

I had a grand time with the LowFERS during our recent Convention in April! With several, I spent some time exchanging ideas, and from each I gleaned more technical and operating ideas. During one session with Jim Weiss (which was continued during our drive back to Sunnyvale) we discussed some experiments he had done. The results of these experiments I believe can be of advantage to all LowFERS.

Jim had done some experiments with the typical top-loaded antenna and had added a "capacitor" to the TOP of this antenna! It was several feet of stove pipe. He claimed measurably improved radiated signal.

Our typical antenna is 15 meters from the transmitter to the end of the longest "top hat guy radial", wherein the mast would be 11 meters tall, and the capacitance hat radials would be 4 meters long.

However, let us put up a 15 meter vertical with any number of 4 meter radials (guys) from the 11 meter position. We gain two ways. An additional 45 pF+ of capacitance and an additional 4 meters of radiator. Yes, it's true that that "top radiator" has diminishing current in it, but the voltage present does tickle the "ether" further away from the ground...a decided advantage. Properly designed, this top capacitor is easy to implement and is not much more expensive. I believe an antenna like this will work better. I suggest that embellishments of this can work much better.

MORE MAILBAG: **Ken Cornell** sent a nice letter from New Jersey. He says, "Pleased to read that some of the West Coast gang are fooling with Part 15.113 (broadcast band) beacons. I note that both Steve, Jim and Ed are operating at the low end of the band from 1600 kHz to 1705 kHz. I have been experimenting with both ends of the band and find the higher end much more favorable to distance covered as the low end. My 1652 kHz beacon **KEN** has been copied by **Herb Balfour** in Richmond Hill, Ontario Canada, and by **Joe Saloka KRY** in Chardon, Ohio."

Frank Bauer (W6FPO) writes, "Got a real kick out of **Mike Mideke's** 'clipping' in WU#54. It had me going for a moment but when I noticed it had no source information or dateline, I became suspicious. Had some fun on 80M/160M quoting the 'item'. Feelings were mixed from...'who needs morse code anyway', to 'they can't do that to us'. Needless to say, I sympathized with all of them for awhile."

David Holland (DCH) advises he will be off for the summer. David says, "I bet I hold the record for the fastest signal report. Thirty seconds after turning DCH on, after being off for the day, I got a phone call from a LF DXer in the Blue Ridge mountains of Virginia...about 150 miles. Seems he was a regular listener to DCH and had left his portable set on my frequency."

EK NOTES: **Ev Paschal** of Stanford University has written a paper titled, "Design of Broadband VLF Receivers with Air Core Loop Antennas". If you have interest in this area, I highly recommend getting a copy. It's available for $5 (copy cost and mailing). Ev's address is in the current list.

A personal editorial comment concerning legal Part 15 beacon operation ---I was embarrased to discover recently that the power level on my **EK** beacon had drifted up a bit. I hadn't checked it for a long while. While this is probably not the end of the world, it reminded me that I have been given a valuable slice of the spectrum to experiment with, and I probably ought to operate as professionally as if I were running a Broadcast station...or any other transmitter.

I recently built the **Mideke "simple" beacon** transmitter (WU#53) and have been having a lot of fun with it. I got the drain and source backwards, and blew the first IRF511 Mosfet. After I corrected the error, the beacon played just fine. I'm experimenting with it at 1 watt on 184.425 kHz. I've mounted it in a plastic lunchbox, together with two 6-volt lantern batteries. Hopefully we'll have time to try some portable operation before long.

I know you're all caught up in the melodrama of SUMMER, but please keep me informed on your activities and plans. I particularly need material for publication...photos, stories, whatever.

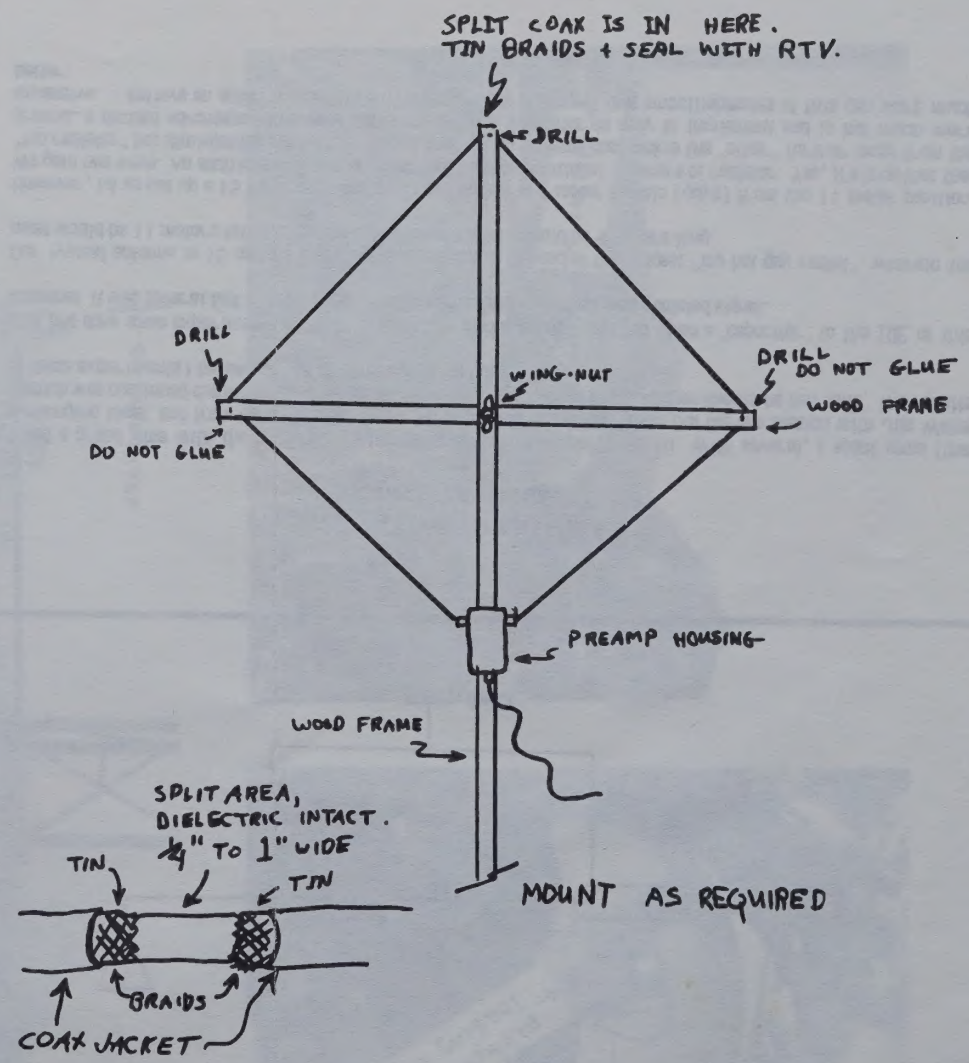
Oh yes, I recently moved the list of active names from the IBM to the Macintosh computer. I proofread the new list carefully, but I suggest you check your listing for any errors that might have crept in. Having the list on the MAC means I can update it at home, instead of having to drive to the IBM at work.

Good listening, Have a fun Summer, and we'll see you in about a month!

A Shielded Loop in 30 Minutes

by: J. Coote

Here is a quick method of making a frame for a shielded coax loop. I used 1 x 1 wood which is OK for temporary or smaller loops. RG59 CATV type coax was used, but I first made sure it was the type whose braid and center could be soldered.
The braid has to be split at the center, like most shielded loops. On this model I made the split ¼" wide and tinned the coax braids by the split.
This piece of coax was passed through holes bored in the top and side corners of the support cross.
The split area was force-fitted inside the top section and then sealed with RTV.
On my loop I used F59 crimp fittings on the coax and box which houses a Burhans loop preamplifier, but I don't recommend these for a heavy duty weatherproof EMP-hardened outdoor loop.
The preamp housing was attached to the bottom section of the structure. My loop could be folded up by detaching the F-59's from the preamp and loosening the bolt in the center of the cross.



Parts list:
8 foot 1x1 or 1x2 for larger loops
10 foot 1x1 or 1x2 for larger loops
1/4 to 5/16 bolt, washers and wing-nut
Coax cable your choice
Coax fittings, your choice, to fit loop preamp housing.
Varnish or enamel paint
Burhans loop antenna preamp in enclosure

Comments:
This is a cheap way to get out a lot of loops, say for a phased array- or get a frame for testing loops of various sizes. The only size comparison done here was a 2.5 foot square loop vs. the 5 foot loop. The larger worked better on LowFER and NDB bands. I was able to get directions on known NDBs and notch out my neighbors' light dimmer.